State of Utah
Implementation Guidance
Electronic Laboratory Reporting (ELR)

Version 1.2
March 8, 2013

Background:

All electronic laboratory report (ELR) messages for the State of Utah will be sent to the Utah Department of Health (UDOH). According to the Utah Administrative Code Rule R386-702,

"Each reporting entity shall report each confirmed case and any case who the reporting entity believes in its professional judgment is likely to harbor an illness, infection, or reportable condition".

This means that laboratories and/or hospitals that use referral laboratories for their testing must report the results of that testing. In addition, it means that referring laboratories are still obligated to report the testing that they perform.

At this time, UDOH is requesting that all laboratories and hospitals that perform testing on Utah citizens, or that have other laboratories perform testing on their patients, for any reportable condition initiate ELR reporting.

Intent:

Utah is requesting that all entities contact UDOH to declare their intent to initiate ELR, and fill out the implementation guide as well as provide a comprehensive vocabulary that they plan to use.

Message Transmission:

Reporting entities must be able to submit ELR messages in a secured manner. UDOH is capable of receiving messages through PHIN-MS, direct connections such as sFTP or TCP, or via the Utah Health Information Network (UHIN).

Message Format:

Laboratories may submit messages in HL7 v2.3.1:ORU^R01 or v2.5.1:ORU^R01. Hospitals seeking Meaningful Use attestation must submit messages in HL7 v 2.5.1:ORU^R01. All messages must conform to the "HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 1 (US Realm)". This implementation guide is available at www.HL7.org in the store. Test messages should be checked against the PHIN Message Quality Framework to ensure that they are structured correctly prior to sending to UDOH.

Required Fields:

In addition to fields required by HL7, the following fields are required by UDOH and provide further explanation:

MSH 4.1 – Sending facility – this is the name of the facility that is sending us the results. For example, if a patient is at Hospital "A", but the test was performed at Hospital "B" – the sending facility for Meaningful Use would be Hospital "A" – where the EHR exists with the patient's information. At this time the use of OIDs is optional. However, sending facilities must provide a translation of their codes, including facility name.

MSH 5.1 – Senders should use "NEDSS"
MSH 6.1 – Senders should use "UDOH"
MSH 7 – Date and time the ELR message was sent
MSH 15 –Senders should use "NE"
MSH 16 – Senders should use "NE"
MSH 21 – Senders should use "PHLabReport"

PID-3.1 – This should be the hospital Medical Record Number. Hospitals must send it, laboratories should send it if known. The Medical Record Number must match the MSH 4.1 sending facility. We do not want a medical record number for the diagnostic facility if the patient is located at another facility.
PID-4 – For facilities using HL7 2.3.1, this can be any other patient identifier as long as it is identified.
PID-5 – Patient first and last names
PID-7 – Date of birth
PID-8 – Sex
PID-11 – Patient address. Hospitals must send patient address, including zip code, laboratories should send it if known. If laboratory does not capture patient address, they must send the name and address/phone number of the ordering provider.
PID 13 – Patient phone number (if known)

PV1-2 – Is patient inpatient, outpatient, or ER visit
PV1-3 – If patient is inpatient, what is their room number
PV1-7 – This is the patient's primary physician (attending doctor)
PV1-44 – If inpatient, this is the patient's admission date and time

ORC-3 – Filler Order Number – if the reporting facility is NOT the facility that performed the test, we need to have the filler order number to link the results from the reporting facility to the results from the performing facility. The filler order number must be used in this circumstance.
ORC 12 (or OBR-16) – Ordering provider – This is the clinician that ordered the test
ORC 14 (or OBR-17) – Phone number to call in the event that there is a problem with the test. This would probably be the contact number for the ordering provider.
ORC 21 – Ordering facility name – This is the facility that placed the lab test request
ORC 22 – Ordering facility address
ORC 24 – Ordering provider address

OBR 3.1 – Filler Order Number – this should be the laboratory accession number only if the reporting entity is using HL7 v2.3.1. If the reporting entity is using HL7 v2.5.1 then the accession number should be located at SPM-2. The filler

order number is assigned by the lab performing the test and sent to the requesting facility. It is the number whereby reports from hospitals can be linked to the corresponding report from performing laboratories.

OBR 4.1 – Universal Service ID – this should be the LOINC code corresponding to the requested test or panel of tests

OBR 4.5 – This should be the lab's description of the ordered test (not the LOINC description)

OBR 7 – This should be the date and time of specimen collection. As some specimens are routinely collected multiple times during the day, it is essential that this field be populated with time in order for public health to logistically organize the results. For entities using v2.5.1 use SPM-17

OBR 15 – Specimen source - This is a mandatory field for all culture-based tests. Use OBR 15 if you are using v2.3.1 and SPM-4 if you are using v2.5.1. Specimen source should use SNOMED CT codes.

OBX 3.1 – Observation Identifier – This should be the LOINC code corresponding to the actual test

OBX 3.4 – For labs using v2.3.1 – put the original text of the lab test (this is the name of the test that is in the laboratory manual and is sent to clinicians) in this field,

OBX 3.9 - For labs using v2.5.1 – put the original text of the lab test (this is the name of the test that is in the laboratory manual and is sent to clinicians) in this field.

OBX 5.1 – Result Code – This should be a SNOMED CT code corresponding to the result for all tests with ordinal result values and all microbiological organism names.

OBX 5.5 – Result Description – This should be the laboratory result description (not the SNOMED-CT description)

OBX 6 – IF OBX 5.1 is a numerical designation, then OBX 6 should be used to express the units of that value

OBX 7 – Because many laboratory tests have reference ranges that include inconclusive or gray areas, and because HL7 does not address this – UDOH will accept complete reference ranges from labs during the onboarding process. Labs will be responsible to update their reference ranges with UDOH as they change.

OBX – 8 – This is used as a modifier field for ordinal results, e.g. if the result is positive, the abnormal flag can be used to indicate a high or a low positive. It is also a mandatory field for submitters who are sending quantitative results that require interpretation. See best practices below.

OBX 11 – Result status – This field indicates whether the report is preliminary, final, or corrected

OBX-19 – Date/Time of analysis – This field is when the laboratory actually performed the test

OBX 23 – This field represents the name of the laboratory that actually <u>performed the test</u>.

NTE-3 – Labs may use NTE-3 for culture results that require further description. Ideally, the NTE segment will appear after the OBX segment. This is the field a lab will use to, among other things, describe that an organism did NOT grow in a culture.

SPM 2 – Specimen ID – This is the laboratory <u>Accession Number</u>
SPM 4 – This is the specimen source. This is a mandatory field for all culture-based tests.
SPM-17 – This is the date and time of specimen collection
SPM-18 – This is the date and time the specimen was received at the lab

Best Practices:
<u>The Utah Department of Health recommends that submitters follow the structure found in Appendix A (HL7 Reporting of Culture and Susceptibilities) of the HL7 v 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 1.</u>

1. **Stool cultures:**
   a. Labs should provide the following information to UDOH on all stool cultures:
      i. The OBR should identify the appropriate LOINC for stool culture in the OBR 3.1 field.
      ii. In subsequent OBX segments, put the appropriate LOINC for stool culture in the OBX 3 field, then list the appropriate SNOMED-CT code for the detected reportable organism in the OBX 5 field.
      iii. Repeat OBX segments (under the same OBR) for each detected reportable organism identified in that culture.
      iv. Indicate the name of organisms that are not detected or identified in an NTE segment, also under the OBR segment.
   b. Pathogen quantitation (e.g. 2+) and antibiotic susceptibility information are not required for stool cultures.
2. **Bacterial disease cultures from sterile sites:**
   a. Labs should provide the following information to UDOH on all bacterial disease cultures identified from sterile sites such as blood, CSF, tissue, body and joint fluids, bone, etc.
      i. The OBR should identify the appropriate LOINC for culture. You may use either generic LOINC codes (e.g. bacterial culture) or specific LOINC codes (e.g. blood culture).
      ii. Do not use LOINC codes for bacterial identification if you are plating a specimen, use LOINC codes for culture, as this is the test you are performing. Only use LOINC codes for bacterial identification if you

have received an isolate from another lab and are verifying its identification.

    iii. Add an OBX segment for every organism isolated (even those that are not reportable) from that culture

    iv. Indicate the quantity of the isolated organism in an OBX segment, using a sub-ID to correlate the quantity with the organism.

3. ***Streptococcal pneumonia* culture from sterile sites:**
   a. Send antibiotic susceptibility profiles of all tested (not just those that were reported to the clinician) antibiotics. Send the antibiotics in subsequent OBX segments using sub-ID to correlate the susceptibility profile with the organism.

4. UDOH prefers that the LOINC code for a panel be placed in the OBR segment, and that the individual tests be listed below that OBR segment in a series of OBX segments.
   a. Example: OBR segment would list the LOINC code for a combo Chlamydia and Gonorrhea PCR test. Following that would be an OBX segment listing a test and result for the Chlamydia portion of the combo test, and then an OBX segment listing the test and result for the Gonorrhea portion of the combo test.
   b. Example: OBR segment would list the LOINC code for a stool culture. Following that would be OBX segments with the same LOINC code and listing each of the isolates identified.

5. Use of **Abnormal Flag:** UDOH is requiring providers who send quantitative results that require interpretation to send that interpretation in the same message in the abnormal flag. For example: A serology test result of 5.1 IU is a submitted result. The interpretation of this result requires the reference range to determine if the result is positive, indeterminate, or negative. The same message should contain a value at OBX 8 with the proper interpretation. UDOH does not want the interpretation in a separate message, as it is difficult to recombine multiple messages. If a quantitative result does not have a reference range (such as a viral load test), then the abnormal flag is not required.

6. **Reference lab:** If a reporting entity has forwarded an isolate to a reference lab, that can be disclosed by using SNOMED CT codes 414976005 (Organism unidentified, referred to CDC) or code 414977001 (Organism unidentified, referred to reference lab for identification). Provision of this information to UDOH is optional. However, when the reporting entity receives results back from either CDC or the reference lab, the reporting entity must then report those final results to UDOH.

7. **Missing or unavailable LOINC or SNOMED CT codes:** If the lab is performing testing that does not have a currently-available LOINC code, leave OBX 3.1 empty and put the local code into OBX 3.4. If a result does not have a currently-available SNOMED CT code, leave OBX 5.1 empty and put a local code into OBX 5.4. All reporters using local codes must submit a value set consisting of codes and translations to ELR@utah.gov.

If a SNOMED CT code is not available, do NOT use a SNOMED code from a different hierarchy level. (For example, if there were no SNOMED code for Salmonella xyz, do not substitute a SNOMED code for Salmonella species, and then insert a more specific code in the local and/or original text fields. Leave the SNOMED code blank and only use the correct/specific local and/or original text fields.)

You may use SNOMED CT code 441742003 "Evaluation finding" as a default code for "Code Unavailable" and then put the actual results in the local code and/or original text field.

8. **Poor message structure practices:**
   a. Splitting one result into multiple messages (these are very difficult to reconstruct back into a single lab report)
   b. Using a LOINC code in the OBX segment with multiple types of results (e.g. using a LOINC code for ordinal results (such as positive) and the same LOINC code for quantitative results (such as 4.3)
   c. Using a LOINC code in the OBX segment with multiple types of units (e.g. using the same LOINC code for results with IU/ml as well as for Log IU/ml results.
   d. Using one OBX to one OBR. While this makes for a simple structure, it fails to accommodate UDOH being able to reconstruct the test without merging many messages into one result. This is very challenging technically. We will not approve this structure for meaningful use.

Version Control:

Version 1.1 (02/11/2013)
- Added "or that have other laboratories perform testing on their patients" to the Background section.
- Added "
- Use of **Abnormal Flag:** UDOH is requiring providers who send quantitative results that require interpretation to send that interpretation in the same message in the abnormal flag. For example: A serology test result of 5.1 IU is a submitted result. The interpretation of this result requires the reference range to determine if the result is positive, indeterminate, or negative. The same message should contain a value at OBX 8 with the proper interpretation. UDOH does not want the interpretation in a separate message, as it is difficult to recombine multiple messages. If a quantitative result does not have a reference range (such as a viral load test), then the abnormal flag is not required." And "It is also a mandatory field for submitters who are sending quantitative results that require interpretation. See best practices below."
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  You may use SNOMED CT code 441742003 "Evaluation finding" as a default code for "Code Unavailable" and then put the actual results in the local code and/or original text field.

Version 1.2 (March 8, 2013)

- Clarified the need to provide original text